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## CLAIMS

1. An optical disk reproduction apparatus for reproducing a signal recorded on an optical disk, in which the optical disk has, recorded thereon, at least a first video stream representing a low frequency component of the video signal and a second video stream representing at least a high frequency component of the video signal, the first video stream includes a plurality of first interleave units and the second video stream includes a plurality of second interleave units, each of the plurality of first interleave units includes m1 GOPs (where m1 is an integer of 1 or greater), each of the plurality of second interleave units includes m2 GOPs (where m2 is an integer of 1 or greater), the optical disk reproduction apparatus comprising:
- a reproduction section for reproducing the first video stream and the second video stream recorded on the optical disk;
  - a division section for dividing the reproduced first video stream into the plurality of first interleave units and for dividing the reproduced second video stream into the plurality of second interleave units;
  - a decoding section for decoding the plurality of first interleave units to generate a first reproduction signal representing the low frequency component of the video signal and for decoding the plurality of second interleave units to generate a second reproduction signal representing at least the high frequency component of the video signal;
  - a synthesis section for synthesizing the first reproduction signal and the second reproduction signal to generate the video signal; and
  - an output section for selectively outputting at least one of the first reproduction signal, the second

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reproduction signal, and the video signal.

2. An optical disk reproduction apparatus according to claim 1, wherein the plurality of first interleave units are each corresponded to first time information relating to reproduction time, and the plurality of second interleave units are each corresponded to second time information relating to reproduction time.

3. An optical disk reproduction apparatus according to claim 2, further comprising:

a reference time signal generation section for generating a reference time signal;

a first reproduction control section for controlling the reproduction time of the first reproduction signal in accordance with the difference between the reference time signal and the first time information;

a second reproduction control section for controlling the reproduction time of the second reproduction signal in accordance with the difference between the reference time signal and the second time information; and

an adjusting section for adjusting the reference time signal so that the reference time signal supplied to the first reproduction control section and the reference signal supplied to the second reproduction control section represent substantially the same time.

4. An optical disk reproduction apparatus according to claim 3, wherein the adjusting section adjusts the reference time signal based on audio reproduction time information representing the time to reproduce an audio signal which is to be output in synchronization with the

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video signal.

5. An optical disk reproduction apparatus according to claim 3, wherein the adjusting section adjusts the reference time signal based on at least one of first video reproduction time information representing the time to reproduce the first reproduction signal and second video reproduction time information representing the time to reproduce the second reproduction signal.

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6. An optical disk reproduction apparatus according to claim 3, wherein:

the first reproduction control section controls the reproduction time of the first reproduction signal by skipping a frame of the first reproduction signal or by reproducing a frame of the first reproduction signal in repetition; and

the second reproduction control section controls the reproduction time of the second reproduction signal by skipping a frame of the second reproduction signal or by reproducing a frame of the second reproduction signal in repetition.

7. An optical disk reproduction apparatus according to claim 1, wherein at least one of the first time information and the second time information includes at least one of a PTS, a DTS and an SCR.

8. An optical disk reproduction apparatus according to claim 1, wherein:

the first reproduction signal corresponds to a first pixel number, and the second reproduction signal corresponds to a second pixel number, which is larger than

the first pixel number,

the synthesis section includes a converter for converting the first reproduction signal into a conversion signal corresponding to the second pixel number, and

5           the video signal is obtained by synthesizing the  
conversion signal and the second reproduction signal.

9. An optical disk reproduction apparatus according to claim 8, wherein the optical disk further has, recorded thereon, an identifier representing the first pixel number corresponding to the first reproduction signal, and the converter converts the first reproduction signal into the conversion signal in accordance with the identifier.

15     10. An optical disk reproduction apparatus according to  
claim 8, wherein:

the optical disk further has, recorded thereon, an identifier representing the first pixel number corresponding to the first reproduction signal, and

20           the optical disk reproduction apparatus further  
includes a rotation control section for controlling the  
rotation of the optical disk, and

the rotation control section controls the rotation of the optical disk in accordance with the identifier.

25            11. An optical disk reproduction apparatus according to  
claim 1, wherein:

the optical disk further has, recorded thereon, an identifier representing that the video signal is obtained by encoding a progressive video signal of 24 frames to 30 frames per second.

the output section includes a converter for converting at least one of the first reproduction signal,

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the second reproduction signal, and the video signal into a frame signal, and

the output section outputs the progressive video signal of 60 frames per second by outputting the frame signal in an overlapping manner.

12. An optical disk reproduction apparatus according to claim 11, further comprising a buffer memory section for storing the plurality of first interleave units and the plurality of second interleave units, and the buffer memory section has a capacity which is equal to or greater than an amount of data of the GOP or GOPs included in the second interleave units.

13. An optical disk reproduction apparatus according to claim 12, wherein the buffer memory section has a capacity which is 1 MB or greater.

14. An optical disk including, recorded thereon, at least a first video stream representing a low frequency component of the video signal and a second video stream representing at least a high frequency component of the video signal, wherein: the first video stream includes a plurality of first interleave units, the second video stream includes a plurality of second interleave units, each of the plurality of first interleave units includes m1 GOPs (where m1 is an integer of 1 or greater), and each of the plurality of second interleave units includes m2 GOPs (where m2 is an integer of 1 or greater).

15. An optical disk according to claim 14, wherein the plurality of first interleave units and the plurality of second interleave units are structured so that reproduction

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time of one of the plurality of first interleave units is substantially equal to reproduction time of one of the plurality of second interleave units, the one of the plurality of second interleave units corresponding to the one of the plurality of first interleave units.

16. An optical disk recording apparatus, comprising:

a dividing section for dividing a video signal into a first video signal representing a low frequency component of the video signal and a second video signal representing at least a high frequency component of the video signal; an encoding section for generating a first video stream by encoding the first video signal and for generating a second video stream by encoding the second video signal, wherein: the first video stream includes a plurality of first interleave units, the second video stream includes a plurality of second interleave units, each of the plurality of first interleave units includes  $m_1$  GOPs (where  $m_1$  is an integer of 1 or greater), and each of the plurality of second interleave units includes  $m_2$  GOPs (where  $m_2$  is an integer of 1 or greater);

a selection output section for selectively outputting the plurality of first interleave units included in the first video stream and the plurality of second interleave units included in the second video stream; and

a recording section for recording the signal output from the selection output section on an optical disk.

17. An optical recording apparatus according to claim 16, wherein the division section includes a decoder for decoding the first video stream and a differential calculator for calculating a differential between the video signal and the signal output from the decoder, and outputs the signal output

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from the differential calculator as the second video signal.

18. An optical recording apparatus according to claim 17,  
wherein the division section further includes:

5       a first converter for converting the video signal  
into a first conversion signal corresponding to a second  
pixel number which is smaller than a first pixel number  
corresponding to the video signal, and

10       a second converter for converting the signal output  
from the decoder into a second conversion signal  
corresponding to the first pixel number which is larger than  
the second pixel number corresponding to the signal output  
from the decoder,

15       wherein the division section outputs the first  
conversion signal as the first video signal, and

      wherein the differential calculator calculates the  
differential between the video signal and the second  
conversion signal.

20       19. An optical disk recording apparatus according to  
claim 17, wherein the recording section further records on  
the optical disk an identifier representing that the second  
video signal is output from the differential calculator.

25       20. An optical disk recording apparatus according to  
claim 17, wherein the recording section further records on  
the optical disk an identifier representing the first pixel  
number corresponding to the video signal.

30       21. An optical disk recording apparatus according to  
claim 17, wherein the recording section further records on  
the optical disk an identifier representing the second pixel  
number corresponding to the first video signal.

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22. An optical disk recording apparatus, comprising:

an input section for receiving an encoded first video stream corresponding to a first pixel number and an encoded second video stream corresponding to a second pixel number which is different from the first pixel number, wherein the first video stream includes a plurality of first interleave units, the second video stream includes a plurality of second interleave units, each of the plurality of first interleave units includes m1 GOPs (where m1 is an integer of 1 or greater), and each of the plurality of second interleave units includes m2 GOPs (where m2 is an integer of 1 or greater);

a selection output section for selectively outputting the plurality of first interleave units included in the first video stream and the plurality of second interleave units included in the second video stream; and

a recording section for recording the signal output from the selection output section on an optical disk.

23. An optical disk reproduction apparatus for reproducing a signal recorded on an optical disk, in which the optical disk has, recorded thereon, at least a first video stream including a plurality of first GOPs and a second video stream including a plurality of second GOPs, each of the plurality of first GOPs includes a plurality of pictures, and each of the plurality of second GOPs includes a plurality of pictures, the optical disk reproduction apparatus comprising:

a reproduction section for reproducing the first video stream and the second video stream recorded on the optical disk;

a decoding section for decoding the first video



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stream and the second video stream; and

an output section for selectively outputting the decoded first video stream and the decoded second video stream in accordance with reproduction control information,

5            wherein the reproduction control information indicates that after a first picture included in a final first GOP among the plurality of first GOPs included in the first video stream is reproduced, a second picture included in a leading second GOP among the plurality of second GOPs  
10           included in the second video stream is reproduced, the second picture being different from a leading picture of the leading second GOP.

24. An optical disk reproduction apparatus according to  
15           claim 23, wherein the decoding section starts decoding the second video stream so that the decoding of the second picture has been completed when the reproduction of the first picture is completed.

20           25. An optical disk reproduction apparatus according to claim 24, wherein:

             the reproduction control information includes information ts1 representing a position of the first picture, information ts2 representing a position of the second  
25           picture, and information tsG representing a position of the leading picture of the leading second GOP, and

             the decoding section finds a decoding start position ta in accordance with expression  $ta = ts1 - (ts2 - tsG)$ , and starts decoding the second video stream based on the decoding  
30           start position ta.

26. An optical disk reproduction apparatus according to claim 24, wherein:

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the reproduction control information includes timing information representing the timing to start decoding the leading second GOP so that reproduction completion time of the first picture matches the reproduction start time of the second picture, and

the decoding section starts decoding the second video stream based on the timing information.

27. An optical disk reproduction apparatus according to claim 23, wherein the decoding section omits decoding of a picture which is not necessary for decoding pictures from the leading picture of the leading second GOP to the second picture.

28. An optical disk reproduction apparatus according to claim 27, wherein the picture which is not necessary is a B picture.

29. An optical disk reproduction apparatus according to claim 23, further comprising a buffer memory section for storing the first video stream and the second video stream, and the buffer memory section has a capacity which is equal to or greater than an amount of data of 1 GOP.

30. An optical disk reproduction apparatus according to claim 23, wherein the reproduction section reproduces the reproduction control information recorded on the optical disk.

31. An optical disk reproduction apparatus according to claim 23, wherein:

the optical disk further has, recorded thereon, an identifier representing whether or not the reproduction

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control information is recorded on the optical disk, and  
when the identifier represents that the  
reproduction control information is recorded on the optical  
disk, the reproduction section reproduces the reproduction  
5 control information recorded on the optical disk.

32. An optical disk reproduction apparatus according to  
claim 23, wherein in a fast reproduction mode, when the  
second picture is not an I picture, the output section  
10 prohibits an I picture included in the leading second GOP  
from being output.

33. An optical disk reproduction apparatus according to  
claim 32, wherein the output section prohibits a part of  
15 the I picture included in the leading second GOP from being  
output based on I picture reproduction prohibition  
information.

34. A reproduction control information generation  
20 apparatus, comprising:

an input section for receiving a first video stream  
including a plurality of first GOPs and a second video stream  
including a plurality of second GOPs; and

a generation section for generating reproduction  
25 control information which represents that after a first  
picture included in a final first GOP among the plurality  
of first GOPs included in the first video stream is  
reproduced, a second picture included in a leading second  
GOP among the plurality of second GOPs included in the second  
30 video stream is reproduced, the second picture being  
different from a leading picture of the leading second GOP.

35. A reproduction control information generation

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apparatus according to claim 34, wherein the reproduction control information includes information representing the number of pictures from the leading picture of the leading second GOP to the second picture.

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36. A reproduction control information generation apparatus according to claim 34, wherein the reproduction control information includes information representing the time to reproduce the leading picture of the leading second GOP and the time to reproduce the second picture of the leading second GOP.

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37. A reproduction control information generation apparatus according to claim 34, wherein the reproduction control information includes timing information representing the timing to start decoding the leading second GOP so that reproduction completion time of the first picture matches the reproduction start time of the second picture.

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38. A reproduction control information generation apparatus according to claim 37, wherein the timing information represents the timing to start decoding the leading second GOP when a picture which is not necessary for decoding pictures from the leading picture of the leading second GOP to the second picture is not decoded.

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39. A reproduction control information generation apparatus according to claim 38, wherein the picture which is not necessary is a B picture.

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40. An optical disk recording apparatus, comprising:  
a generation section for generating reproduction control information; and

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5 a recording section for recording the reproduction control information on an optical disk having, recorded thereon, a first video stream including a plurality of first GOPs and a second video stream including a plurality of second GOPs,

10 wherein the reproduction control information represents that after a first picture included in a final first GOP among the plurality of first GOPs included in the first video stream is reproduced, a second picture included in a leading second GOP among the plurality of second GOPs included in the second video stream is reproduced, the second picture being different from a leading picture of the leading second GOP.

15 41. An optical disk recording apparatus, comprising:

an editing section for editing a first video stream including a plurality of first GOPs and a second video stream including a plurality of second GOPs so that at least one picture unnecessary for reproduction is deleted; and

20 a recording section for recording the edited first video stream and the edited second video stream on an optical disk,

25 wherein the reproduction control information represents that after a first picture included in a final first GOP among the plurality of first GOPs included in the first video stream is reproduced, a second picture included in a leading second GOP among the plurality of second GOPs included in the second video stream is reproduced, the second picture being different from a leading picture of the leading second GOP.

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42. An optical recording apparatus according to claim 41, wherein the at least one picture unnecessary for

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reproduction includes a picture, of the first video stream, after the first picture, and a picture, of the second video stream, before the second picture.

5      43. An optical recording apparatus according to claim 42,  
wherein the at least one picture unnecessary for  
reproduction further includes a picture which is not  
necessary for decoding pictures from the leading picture  
of the leading second GOP in the second video stream until  
10     the second picture.

44. A reproduction control information generation  
apparatus according to claim 43, wherein the at least one  
picture unnecessary for reproduction is a B picture.

15     45. An optical recording apparatus according to claim 41,  
wherein the recording section records the edited first video  
stream and the edited second video stream in continuous  
regions of the optical disk.

20     46. An optical recording apparatus according to claim 41,  
wherein the recording section records the reproduction  
control information on the optical disk.

25     47. An optical recording apparatus according to claim 41,  
wherein the recording section records the reproduction  
control information on a medium other than the optical disk.

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